APPENDIX 3

Claims filed in U.S. Serial No.08/892,738 filed July 15, 1997.
Claims 5-8, 13-16, 20 and 22-24 issued October 5, 1999.
(Claims 1-4, 9-12, 17-19, 21, 25 and 26 filed in
Continuation Application 09/288,943 filed April 9, 1998.
Pending July 15, 1997 through March 30, 1999.)

What is claimed is:

1. A stationary gas turbine engine for a power plant, comprising:

(a) a multistage axial compressor, the compressor having a rotor, the rotor having a cylindrical land region downstream of a last-stage of the compressor, the land region having an outside diameter D;

(b) a turbine shaft-coupled to the rotor of the compressor;

(c) a combustor fluid coupled between the compressor and the turbine;

(d) a stationary inner barrel member downsttream of the compressor, air flowing from the compressor to the combustor passing outside of the inner barrel member, a chamber within the inner barrel member forming a passage for cooling air from the compressor, the cooling air flowing from the chamber and being mixed with combustion gases upstream of the turbine;

(e) a brush seal for restricting air passage into the chamber from the compressor, the brush seal comprising:

(i) a ring-shaped holder;

(ii) a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder; and

(iii) means for fastening the holder to the inner barrel member,

wherein, when the power plant is inactive, the bristles have an ambient temperature clearance of not less than 0.015 percent of the diameter D from the land region of the rotor.

2. The engine of claim 1, further comprising means for selectively altering the flow of cooling air from the chamber, comprising:

(a) a passage extending through one wall of the inner barrel;

(b) means for connecting the fluid port to an auxiliary source of pressure air external of the inner barrel, whereby pressure air from the auxiliary source augments the flow of cooling air from the chamber; and

(c) means for changeably restricting flow of pressure air into the chamber from the auxiliary source of pressure air.

3. The engine of claim 2, wherein the compressor provides at least a portion of the auxiliary source.

4. The engine of claim 3, wherein the means for changeably restricting comprises means for removably mounting a device in the passage, the device being selected from the set consisting of a plug and a jet.

5. The engine of claim 1, wherein the means for selectively altering further comprises:

(a) a valve for adjustably restricting flow of pressure air into the chamber from the auxiliary source of pressure air; and

(b) means for monitoring an operating parameter of the engine, the operating parameter being responsive to the flow of cooling air from the chamber.

6. The engine of claim 5, wherein the valve is a calibrated needle valve.

7. The engine of claim 5, wherein the means for monitoring comprises a temperature sensor for indicating a temperature within the chamber.

8. The engine of claim 5, further comprising an outer barrel surrounding the inner barrel and having a fluid port extending radially through one wall thereof, the gas flow from the compressor to the combustor passing between the outer barrel and the inner barrel, the means for connecting the fluid port comprising a fluid conduit connected between the passage and the fluid port, and means for connecting the auxiliary source of pressure air to the fluid port external of the outer barrel.

9. The engine of claim 1, further comprising an insert ring connecting segments of the inner barrel member, the insert ring being located proximate the land region of the rotor, wherein the means for fastening the brush seal to the inner barrel member comprises the holder being fastened to the insert ring by a plurality of threaded fasteners.

10. The engine of claim 9, wherein the brush seal, including the holder thereof is segmented for facilitating assembly with the insert ring.

11. In a turbine power plant having a multistage axial compressor, a turbine shaft-coupled to a rotor of the compressor, a combustor fluid-coupled between the compressor and the turbine, and a labyrinth seal between the rotor and a stationary inner barrel member, the rotor having a cylindrical land region of diameter D, the improvement comprising a brush seal connected to the inner barrel and augmenting the labyrinth seal, being fluid connected in series therewith, the brush seal comprising:

(a) a ring-shaped holder;

(b) a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder; and

(c) means for fastening the holder to the inner barrel member,

wherein, when the power plant is inactive, the bristles have an ambient temperature clearance of not less than 0.015 percent of the diameter D from the land region of the rotor.

12. The turbine power plant of claim 11, the further improvement comprising means for selectively altering the flow of cooling air from the chamber, comprising:

(a) a passage extending through one wall of the inner barrel;

(b) means for connecting the passage to an auxiliary source of pressure air external of the inner barrel, whereby pressure air from the auxiliary source augments the flow of cooling air from the chamber;

(c) means for changeably restricting flow of pressure air into the chamber from the auxiliary source of pressure air.

13. In the turbine power plant of claim 11, wherein the means for selectively altering comprises:

(a) a valve for adjustably restricting flow of pressure air into the chamber from the auxiliary source of pressure air; and

(b) means for monitoring an operating parameter of the engine, the operating parameter being responsive to the flow of cooling air from the chamber.

14. In the turbine power plant of claim 13, the further improvement wherein the means for adjustably restricting comprises a calibrated needle valve.

15. In the turbine power plant of claim 13, the further improvement wherein the means for monitoring comprises a temperature sensor for indicating a temperature within the chamber.

16. In the turbine power plant of claim 13, wherein the power plant also having an outer barrel surrounding the inner barrel, the gas flow from the compressor to the combustor passing between the outer barrel and the inner barrel, the further improvement comprising a fluid port extending radially through one wall of the outer barrel, the means for connecting the fluid port comprising a fluid conduit connected between the passage and the fluid port, and means for connecting the auxiliary source of pressure air to the fluid port external of the outer barrel.

17. A method for controlling cooling air flow in a turbine power plant having a multistage axial compressor, a turbine shaft-coupled to a rotor of the compressor, a combustor fluid coupled between the compressor and the turbine, and a labyrinth seal between the rotor and a stationary inner barrel member, the rotor having a cylindrical land region of diameter D, comprising the steps of:

(a) providing a brush seal having a ring-shaped holder, a multiplicity of bristle members extending radially inwardly from the holder toward the land region of the rotor, outer extremities of the bristle members being rigidly retained relative to the holder;

(b) connecting the brush seal in augmenting relation to the labyrinth seal; and

(c) spacing the bristle members from the land region of the rotor by an ambient temperature clearance of not less than 0.015 percent of the diameter D when the power plant is inactive.

18. The method of claim 17, wherein the power plant includes an insert ring fastened to the inner barrel member in axially spaced relation to a portion of the rotor member, the method comprising the further steps of:

(a) removing the insert ring from the inner barrel member;

(b) providing an adapter ring;

(c) mounting the brush seal to the adapter ring; and

(d) fastening the adapter ring to the inner barrel member in place of the insert ring.

19. The method of claim 18, wherein the step of providing the adapter ring comprises the step of modifying the insert ring.

20. The method of claim 17, comprising the further steps of:

(a) providing an auxiliary source of pressure air;

(b) fluid-connecting the auxiliary source to an interior cavity portion of the inner barrel member for augmenting the flow of cooling air;

(c) connecting an adjustable valve between the auxiliary source and the inner barrel member for variably restricting air flow from the auxiliary source and the inner barrel member;

(d) monitoring an operating parameter of the power plant; and

(e) adjusting the adjustable valve in response to changes in the operating parameter.